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(54) IMAGE PICKUP DEVICE

(57) Abstract:

PROBLEM TO BE SOLVED: To attain image pickup of a stereoscopic image and high definition image by the same image pickup device.

SOLUTION: A lens 10 for stereoscopic image pickup and a lens 20 for high definition image pickup are prepared and either of them is mounted to an image pickup main body 100. In the case of using the lens 10 for stereoscopic image pickup, a light from optical systems 13, 14 of the right system is made incident to a lower half of an image pickup face of the image pickup section 52 and picked up and the light from optical systems 11, 12 of the left system is made incident to an upper half of an image pickup face of the image pickup section 52 and picked up. In the case of using the lens 20 for high definition image pickup, the light from the lens is made incident to the entire face of the image pickup face of the image pickup section 52 and picked up.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image pick-up equipment which picturizes the image, a left channel (L) and a right channel (R), of two channels at least especially about the image pick-up equipment which picturizes an image.

[0002]

[Description of the Prior Art] As a technique which photos the image of an object in order to generate a solid image, two image pick-up equipments, the object for left channels (L) and the object for right channels (R), are arranged right and left, and the technique which photos a two image pick-up equipment object simultaneously is known. moreover, as a technique which displays a solid image from the image of two channels photoed by doing in this way While displaying the image of a left channel (L), and the image of a right eye (R) channel by turns on the one display screen Special glasses close an appreciation person's left eye and right eye by turns, and the technique only the image of a left channel (L) is visible to an appreciation person's left eye, and it is made visible [the technique / only the image of a right channel (R)] to a right eye is known.

[0003] Moreover, the image pick-up equipment based on the NTSC system which is the present domestic standard television system has been used for each of two image pick-up equipments, the object for left channels (L), and the object for right channels (R). In this case, the aspect ratio of horizontal *** of the solid image obtained is set to 4:3, and, as for the number of scanning lines, a left channel and a right channel set it 525.

[0004] Now, as a television system, high-definition TV JON methods mentioned above, such as a Hi-Vision method, an ATV method, etc. twice [about] the number of scanning lines of NTSC system besides NTSC system, are learned. In addition, being referred to as 16:9 is prescribed [aspect ratio / of 1125 and an image] by the Hi-Vision method in the number of scanning lines of an image. Moreover, recently, though based on the NTSC system called the so-called wide broadcast, ED method and the EDII method which were set to 16:9 of a letter box format are put [aspect ratio / of 525 and an image] in practical use in the number of scanning lines of an image.

[0005] Thus, as a television system of an one-channel method, the various methods with which the number of scanning lines differs from an aspect ratio coexist. Moreover, an aspect ratio is desired for implementation of the solid image of 16:9 etc. also about the television system of a two-channel method, for example.

[0006]

[Problem(s) to be Solved by the Invention] Now, since according to the technique which picturizes the conventional solid image two image pick-up equipments, the object for left channels (L) and the object for right channels (R), are needed in order to obtain one solid image, it is not economical and handling is also inconvenient.

[0007] Moreover, in order to obtain the image of one channel of methods other than NTSC system, the image pick-up equipment based on the method of the image which it is going to obtain separate from

two cameras based on this NTSC system is needed. Moreover, in order for an aspect ratio to obtain the solid image of 16:9, two image pick-up equipments which picturize an image by the aspect ratio 16:9 are needed too.

[0008] Then, this invention aims at offering the image pick-up equipment which can picturize the image, a left channel (L) and a right channel (R), of two channels by one set.

[0009] Furthermore, while being able to picturize the image, a left channel (L) and a right channel (R), of two channels by one set, it aims at offering the image pick-up equipment which can picturize the image of one channel based on 1 or two or more methods.

[0010] Moreover, it aims at offering the record regenerative apparatus suitable for management of the image photoed with these image pick-up equipments, or record and playback.

[0011]

[Means for Solving the Problem] The image pick-up section which generates the picture signal showing the image which this invention was equipped with the light-receiving side, and carried out image formation on the light-receiving side concerned for said object achievement, the record signal for recording the image which performs predetermined processing to the picture signal which the image pick-up section concerned generated, and the picture signal concerned expresses with it -- or The image pick-up section body section equipped with the signal-processing section which generates the status signal for displaying the image which the picture signal concerned expresses, The optical system for right channel photography which carries out image formation of the optical image of an object to the field for right channel image photography which is a field of the abbreviation one half of said light-receiving side, To the field for left channel image photography which is a field of the abbreviation one half of said light-receiving side, and is a field which does not include said field for right channel image photography The image pick-up equipment characterized by having the lens section for solid image photography equipped with the optical system for left channel photography which carries out image formation of the optical image of the object incorporated on the left of the optical system for right channel photography is offered.

[0012] According to this image pick-up equipment, since it is used dividing the image pick-up section into the field for left channel image photography, and the field for right channel image photography, the lens section for solid image photography which carries out image formation of the image of an object to these fields respectively can be removed, and the image pick-up equipment which can picturize the image of two channels with the almost same configuration as usual at one set can be constituted.

[0013] Furthermore, if it has said lens section for solid image photography and the lens section for single channel image photography used selectively which equipped the **** field of said light-receiving side with the optical system which carries out image formation of the optical image of an object, in this image pick-up equipment, it will also become possible to picturize the image of one channel.

[0014] Moreover, the playback section which reproduces the record signal which this invention equipped with the portable mold storage with which the record signal with which said image pick-up equipment is equipped for said object achievement, and the photoed image is expressed was recorded, and was recorded on the portable mold storage concerned, and a recognition signal, A transfer means to transmit said record [which controls the record playback section which performs record and playback of the 2nd of a storage, and said playback section and said record playback section] signal by which it was recorded on said portable mold storage, and a recognition signal to said 2nd storage, Predetermined processing which becomes settled according to the recognition signal reproduced from the 2nd storage by said record playback section is performed to the record signal reproduced from the 2nd storage, and the regeneration equipment characterized by having a means to output the signal for displaying the image which the record signal concerned expresses is offered.

[0015] It not only can display the image of one channel photoed by image pick-up equipment, and the solid image formed with the image of two channels, but according to such a record regenerative apparatus, it can arrange and record these images on the 2nd record medium.

[0016]

[Embodiment of the Invention] Hereafter, 1 operation gestalt of this invention is explained.

[0017] The configuration of the image pick-up equipment applied to this operation gestalt at drawing 1 is shown.

[0018] The image pick-up equipment shown in drawing 1 is image pick-up equipment of a lens exchange mold, and it is used for the image pick-up section body 100 for one of two or more kinds of lenses by it, equipping. Drawing 1 (a) shows the place equipped with the lens 10 for solid image photography, and drawing 1 (b) expresses signs that the photography section body was equipped with the lens 20 for highly minute image photography.

[0019] The image pick-up section body 100 consists of a color filter 51, the image pick-up section 52 which used the solid state image pickup device of two-dimensional molds, such as CCD, the signal-processing section 50, the signal-processing section 50, and the mounting section 30 so that it may illustrate.

[0020] As this image pick-up section 52 is shown in drawing 2, mostly, the aspect ratio of horizontal **** is a:b=16:9, the number of the scanning lines (line) is 1125, and the image pick-up of a highly minute image is attained. Moreover, the signal-processing section 50 is a predetermined format, and records the picture signal from the image pick-up section 52 on a record medium 60. Moreover, the picture signal from the image pick-up section 52 is outputted from an output terminal 1.

[0021] The mounting section 30 is bayonet mounting even if, when the mounting section 30 is equipped with the lens 10 for solid image photography, a solid mode signal is sent to the signal-processing section 50 through the contact of the mounting section 30 concerned, and when the mounting section 30 is equipped with the lens 20 for highly minute image photography, a highly minute mode signal is sent to the signal-processing section 50. The signal-processing section 50 recognizes photography mode (solid mode / highly minute mode) according to these solid mode signals and a highly minute mode signal.

[0022] The lens 10 for solid image photography has the 1st optical system for the 1st image information (L) image pick-up which consists of a lens 11 for left eyes, and prism 12, and the lens 13 for right eyes and the 2nd optical system for the 2nd image information (R) image pick-up which consists of prism 14.

[0023] Moreover, the lens 20 for highly minute cameras has the 3rd optical system for the 3rd image information (H) image pick-up which consists of lenses 21 for highly minute.

[0024] In addition, a shutter 40 is formed in this lens 10 for stereoscopic cameras, and the lens 20 for highly minute cameras if needed.

[0025] When it equips with the lens 10 for solid image photography The 1st optical image which passed the 1st optical system (11, 12, 40) of a lens 10 Through a color filter 51, as shown in drawing 2 (a), in the field (the 1st field) of aspect ratio a:b / 2 almost in the upper half of the image pick-up section 52, image formation is carried out, it is picturized, and reading appearance is carried out to the signal-processing section 52 as the 1st image information (L). moreover, the 2nd optical image which passed the 2nd optical system (13, 14, 40) of a lens 10 -- a color filter 51 -- minding -- the image pick-up section 52 -- mostly, image formation is carried out, it is picturized in the field (the 2nd field) of aspect ratio a:b / 2 of a lower half, and reading appearance is carried out to the signal-processing section 52 as the 2nd image information (R).

[0026] However, image formation of the 1st and 2nd optical image is carried out to each 1st [of the image pick-up section 52], and 2nd field as an optical image contracted in the vertical direction about 1/2, respectively. Specifically, an optical perpendicular direction is compressed into lenses 11 and 13 using the anamorphic lens made distorted optically. In addition, the light which passed the 1st optical system (11, 12, 40) carries out incidence to the 2nd field, or the mask which carries out the mask of the unnecessary part of a beam of light is prepared in the outgoing radiation side of prism 12 and 14 so that the light which passed the 2nd optical system (13, 14, 40) may not carry out incidence to the 1st field.

[0027] Based on the solid mode signal from the mounting section 30, the signal-processing section 50 is in solid mode, and current photography mode recognizes that the image pick-up of a solid image is performed, performs predetermined signal processing to the 1st image information L and the 2nd image information R which were read from the image pick-up section 52, and generates a record signal, and it memorizes it to a storage 60. Moreover, additional information, such as inclusion speech information

recorded in the speech processing section which omitted the mode identification information which shows that a photograph was taken in solid mode, the day entry which shows that photography day, the photoed number of sheets (or record address to a record medium 60) of an image, and a graphic display on this occasion, is also memorized by the analog or the digital format to a storage 60.

[0028] Moreover, the signal-processing section 50 outputs the status signal which performed and generated predetermined signal processing to the 1st image information L and the 2nd image information R which were read from the image pick-up section 52 from an output terminal 1 with a predetermined synchronizing signal if needed. This status signal is supplied to image display devices, such as a television set and a monitor, and the display of a solid image is performed.

[0029] On the other hand, when it equips with the lens 20 for highly minute cameras The optical image (the 3rd image information H of *****) which passed the 3rd optical system (21 40) of the lens 20 for highly minute cameras it is shown in drawing 2 (b) through a color filter 51 -- as -- aspect ratio a:b of the image pick-up section 52 -- mostly, image formation is carried out to all fields (the 3rd field), it is picturized, and reading appearance is carried out to the signal-processing section 50 as highly minute image information (the 3rd image information H). In addition, optical picture compression [like the solid image pick-up of **] whose lens 20 for this highly minute image pick-up is is not performed, but image formation of the 3rd image information H is carried out to the 3rd field with the optical image of the condition of normal, without being compressed at all.

[0030] Based on the highly minute mode signal from the mounting section 30, the signal-processing section 50 is in highly minute mode, and current photography mode recognizes that the image pick-up of a highly minute image is performed, performs predetermined signal processing to the 3rd image information read from the image pick-up section 52, and generates a record signal, and it memorizes it to a storage 60. Moreover, additional information, such as inclusion speech information recorded in the speech processing section which omitted the mode identification information which shows that a photograph was taken in the highly minute mode, the day entry which shows that photography day, the photoed number of sheets (or record address to a record medium 60) of an image, and a graphic display on this occasion, is also memorized by the analog or the digital format to a storage 60.

[0031] Moreover, the signal-processing section 50 outputs the status signal which performed and generated predetermined signal processing to the 3rd image information read from the image pick-up section 52 from an output terminal 1 with a predetermined synchronizing signal if needed. This status signal is supplied to image display devices, such as a television set and a monitor, and the display of a solid image is performed.

[0032] As mentioned above, according to the image pick-up equipment concerning this operation gestalt, even if the modes (is it in solid mode or highly minute mode?) of photography differ, the image pick-up section 52 is made in common. Moreover, most signal processing in the signal-processing section 50 can also be carried out in common in both the modes.

[0033] For example, only suppose that it is the output to an output terminal 1 to change only the period of the Vertical Synchronizing signal outputted synchronizing with a status signal from the signal-processing section in solid mode and the highly minute mode. Hereafter, this point is explained.

[0034] The status signal and synchronizing signal which are outputted when (b) photos the status signal and synchronizing signal which are outputted when a photograph is taken in solid mode to drawing 3 (a) in the highly minute mode to drawing 3 are shown.

[0035] when a photograph is taken in the highly minute mode, the Vertical Synchronizing signal shown in ** is generated in the signal-processing section 50 by the status signal shown in (**) of drawing 3 (b), and the Horizontal Synchronizing signal shown in (**), and is outputted to it from an output terminal 1.

[0036] Here, the case where frame frequency generates a 30Hz (field frequency is 60Hz) status signal is shown. Moreover, the figure appended to drawing shows a line number, and h shows a line period.

[0037] In this case, as shown in (**), it is divided into the two fields, the 1st and the 2nd, (that field period is $562.5h=1 / 60$ seconds), and the 3rd image information H picturized in the 3rd field in each of that field is outputted so that each frame containing the 1125 number of scanning lines (line number #1 to #1125) may contain the number of scanning lines $1125 / 2 = 562.5$ per field.

[0038] Horizontal Synchronizing signal HD 2 which, on the other hand, has timing as shown in (e) and (***) of drawing 3, respectively in the signal-processing section 50 Vertical Synchronizing signal VD2 It is generated and is outputted to an output terminal 1 with the status signal in the highly minute mode of (d).

[0039] If image display of the signal from this output terminal 1 is supplied and carried out to a television set or a monitor, as shown in (b) of drawing 4, it becomes the phase relation which carries out an interlace by 2:1 mutually in that 1st field and 2nd field, and the image display of the 1000 same scanning lines (1125) as Hi-Vision will accomplish.

[0040] In addition, the line of line number #1 to #563 shown in drawing 3 and drawing 4 is a line of the image picturized with the line (1, 3, 5...1125) of the odd number sequence eye of the image pick-up section 52, and the line of line number #564 to #1125 is a line of the image picturized with the line (2, 4, 6...1124) of the sequence eye of the even number of the image pick-up section 52.

[0041] Next, they are the status signal shown in (**) of drawing 3 from an output terminal 1 when a photograph is taken in solid mode, and Horizontal Synchronizing signal HD 1 of (**). Vertical Synchronizing signal VD1 of (Ha) It is generated and is outputted to an output terminal 1.

[0042] The content of these signals is Vertical Synchronizing signal VD1 of (Ha). It is only that that the period is one half of Vertical Synchronizing signal VD2 (**)'s at the time of the highly minute mode differs from the case in the highly minute mode.

[0043] Namely, each frame containing the 1125 number of scanning lines is divided into the four fields, the 1st, the 2nd, the 3rd, and the 4th, so that the number of scanning lines $1125 / 4 = 281.25$ may be included per field (the field period is $281.25h = 1 / 120$ seconds). In the 1st field of line number #1 to #282, and the 3rd field (namely, odd number field) of line number #563 to #844 The 1st image information L picturized in the 1st field is outputted, and the 2nd image information R picturized in the 2nd field is outputted in the 2nd field of line number #282 to #563, and the 4th field (namely, even number field) of line number #844 to #1125.

[0044] In addition, the boundary line of the above field [1st] and the 2nd field, the boundary line of the 2nd field and the 3rd field, The boundary line of the 3rd field and the 4th field or the boundary line of the 4th field and the 1st field of the following frame Since an image becomes the period made into an invalid by the period of blanking when carrying out image display also of any, An image pick-up in the image pick-up section is stopped temporarily, and you may make it form the so-called blanking period when a signal is not outputted over the period of one line thru/or two or more lines before and behind these boundary lines.

[0045] Phase relation which carries out an interlace by 2:1 mutually also in the 2nd field where phase relation which carries out an interlace by 2:1 mutually in the 1st field and the 3rd field where the 1st image information (the 1st channel) L is displayed as shown in (a) of drawing 4 is obtained, and the 2nd (it is 2nd channel) image information R is displayed by the output of drawing 3 (a), and the 4th field is obtained.

[0046] therefore, the signal of each channel of the image information L of a left eye channel and the image information R of a right eye channel is displayed with the 500 scanning lines ($281.25 \times 2 = 562.5$ **), respectively -- having -- the whole -- scanning-line 500x -- it is displayed by two channels = 1000 ($562.5 \times 2 = 1125$ **).

[0047] In addition, although this display image is reflected as a double image of the left eye image L and the right eye image R, vision of this double image can be carried out as a solid image using the optical shutter glasses which used liquid crystal etc.

[0048] That is, if it is made to open and close synchronizing with the field period of a status signal so that shutter glasses on either side may be switched to field alternation (every 1 / 120 seconds), the left eye image information L is reflected in a left eye and it is made for the right eye image information R to be reflected in a right eye, an appreciation person can be made to do vision as a solid image.

[0049] In addition, if right and left of these shutter glasses are made to open and close simultaneously in either the odd number field of a status signal, or the even number field, vision of the solid image can be carried out with the 500 scanning lines (562.5) by the monophonic recording.

[0050] Moreover, although a photographic subject image is compressed about 1/2 perpendicularly and is optically picturized in this solid mode, if it displays as follows, in a television set or a monitoring device, the normal solid image which this serves as distortion, is not displayed and does not have distortion can be displayed.

[0051] namely, vertical-synchronization information VD2 on the drawing 2 (**) in the highly minute mode Vertical-synchronization information VD1 on drawing 2 [in / it receives and / solid mode] (Ha) Since a period is set to one half, the difference between origin or this vertical period is identified for identification information by the television set or monitor side. When one half of solid modes (1 / 120 seconds) are identified, a vertical period If a vertical scanning is switched so that a vertical deflection rate (vertical modification distance per line) may double from the case where a vertical period is in usual highly minute mode of 1 (1 / 60 seconds) The image displayed in this solid mode is expanded twice [about] perpendicularly (spacing of the scanning line doubling in the example of drawing 4), and the display without distortion can be made to perform.

[0052] As mentioned above, the content of signal processing which the signal-processing section 50 performs about the output to an output terminal 1 showed the almost same thing.

[0053] Moreover, although detailed explanation is omitted, if it is made to carry out suitable regeneration to processing of playback of an image in which signal processing for memorizing a signal to the storage 60 of the signal-processing section 50 was also photoed in each mode according to the information on the photography mode memorized by the storage in the regenerative apparatus (mode identification information) at the time of playback of an image, signal processing in the signal-processing section 50 can be communalized.

[0054] Now, in the above explanation, the image pick-up of the image in the image pick-up section 52 of aspect ratio a:b at the time of solid mode picturized the image of the 1st image information L in the field of aspect ratio a:b / 2 of the Johan section, and picturized the image of the 2nd image information R in the field of aspect ratio a:b / 2 of the bottom half section. However, a response with the field of the image pick-up section 52, and the image of the 1st image information L and the image of the 2nd image information R is not necessarily restricted to this.

[0055] For example, as shown in drawing 5 , the 1st and 2nd optical system of the lens 10 for solid images may be constituted so that the image of the 1st image information L may be picturized in the field of aspect ratio a/2:b of the right half part of this image pick-up section 52 and the image of the 2nd image information R may be picturized in the field of aspect ratio a/2:b of a left half part. With this configuration, in displaying a solid image with the status signal shown in (a) of previous drawing 2 With each frame constituted from the 1st, 2nd, 3rd, and 4th 4 field by the signal-processing section 50 (or 50') While outputting the 1st image information L of a right half part to the 1st and 3rd odd number field and making the 2nd image information R of a left half part output to the 2nd and 4th even number field, what is necessary is just made to perform transform processing which carries out time-axis expanding twice [about] horizontally for every line in each of that field.

[0056] Moreover, although the case where the aspect ratio of the image pick-up in the image pick-up section 52 was set as a:b=16:9 was shown in the example, this aspect ratio may consist of examples so that it can be set as arbitration, for example, may picturize by a:b=4:3.

[0057] Furthermore, as shown in drawing 6 (a), you may constitute so that it may picturize in the field which the aspect ratio of a light sensing portion effective in an image pick-up narrowed to a':b'=4:3 using the image sensor with which a:b=16:9 are defined. or the image sensor with which the light sensing portion is set to reverse a:b=4:3 as shown in drawing 6 (b) -- using -- a' -- it picturizes in the field narrowed to :b'=16:9 -- as -- you may constitute -- or the image of 16:9 -- optical -- horizontal -- about -- you may constitute so that it may contract to three fourths and may picturize in all the fields of a:b=4:3.

[0058] Especially, according to the method of picturizing this former (a), the image pick-up of the stereo and highly minute image which have the same aspect ratio (4:3) as the present television methods (NTSC, PAL, SECAM system, etc.) is attained.

[0059] Moreover, according to the method of picturizing latter (b), the image pick-up of the stereo of an

aspect ratio 16:9 and a highly minute image is attained using the image sensor of the aspect ratio 4:3 of currently possessed.

[0060] In addition, in changing an aspect ratio and picturizing it, the signal-processing section 50 adds the information which identifies the aspect ratio of the image pick-up to the identification information which identifies photography mode, and records it on a storage. By doing in this way, the generation and right image display of a status signal which were [aspect ratio / of the information signal recorded on a record medium 60 or 70 in the regenerative apparatus based on this added identification information at the time of playback / the photography mode and the aspect ratio] suitable for a direct deed and it in discernment can be performed now.

[0061] In addition, with the image pick-up equipment concerning this operation gestalt, it is nH horizontally. It is nV to an individual and a perpendicular direction. So that the two-dimensional space containing the space sampling point of the total (nH xnV) individual of a book may be picturized. For example, it is nH horizontally at significant part. It is nV to an individual and a perpendicular direction. Although the two-dimensional solid state image pickup device which has the pixel array of the total (nH xnV) individual of a book is used for the image pick-up section 52. For example, it is nV in order to secure the same active scanning line per frame N as Hi-Vision (for example, N= 1036) in the highly minute mode. A solid state image pickup device which serves as a larger value than this active scanning line per frame N is used.

[0062] And the image pick-up section 52 constitutes the **** image pick-up section 52 for 3 plates for such a solid state image pickup device in red, blue, and a green three-primary-colors image pick-up.

[0063] However, the image pick-up section 52 can also constitute the **** image pick-up section 52 for veneers for a solid state image pickup device with the color filter 51 which arranged the filter of RGB in order.

[0064] Moreover, the **** image pick-up section 52 for 3 plates can also be constituted for the two-dimensional solid state image pickup device which has nV / two totals (nH xnV) / four pixel arrays to nH / two pieces, and a perpendicular direction horizontally.

[0065] That is, as shown in drawing 7, the image pick-up section 52 consists of prism 53, 54, and 55, solid state image pickup devices 56, 57, and 58, and a color filter 59.

[0066] In such a configuration, through prism 55, 54, and 53, image formation of the optical image from a lens is carried out, and it is picturized on solid state image pickup devices 58 and 57 and 56, respectively.

[0067] As for each light sensing portion effective in the image pick-up of these solid state image pickup devices 56, 57, and 58, the image sensor with which the aspect ratio of horizontal **** is set to a:b, and all has nV / two totals (nH xnV) / four pixel arrays to nH / two pieces, and a perpendicular direction horizontally as the number of pixels effective in the image pick-up is used.

[0068] Among this, the image pick-up about the brightness information Y of a stereo or highly minute image information or the color information G is performed with solid state image pickup devices 56 and 57. These two solid state image pickup devices [each other / a part for 1/2 pitch of pixel spacing and a perpendicular direction] 56 and 57 of each other are horizontally attached in prism 53 and 54 in the condition of having shifted spatially, by 1/2 pitch at intervals of a pixel pitch, respectively. However, in picturizing 1 color information G, it prepares the color filter for taking out this color information G on an optical path (the reflector of prism 53, 54, and 55, or light-receiving side of solid state image pickup devices 56 and 57).

[0069] In this case, although the brightness information Y which contains the total (nHxnV) / two pixels per frame, or the 1st color information G is picturized in solid state image pickup devices 56 and 57 A pixel location is nH horizontally in that of 1 / 2 pitch *****. It is nV to an individual and a perpendicular direction. The image pick-up (related with brightness) of the two-dimensional space containing the space sampling point of the total (nH xnV) individual of a book becomes possible with two solid state image pickup devices 56 and 57.

[0070] On the other hand, in a solid state image pickup device 58, the image pick-up about the color information B and the color information R is performed, and, for this reason, the color filter 59 for

separating such color information is formed in that light sensing portion. In this example, the color filter 59 formed in checkers by turns [of a horizontal direction and a perpendicular direction] is used for the red filter for taking out the blue filter for taking out the 2nd color information B, and the 3rd color information R.

[0071] Therefore, although the color information R which contains the total $(nH \times nV) / 8$ pixels per frame in a solid state image pickup device 58 in this case as well as the color information B which contains the total $(nH \times nV) / 8$ pixels per frame is picturized According to a checkered pixel array, the image pick-up (related with a color) of the two-dimensional space which contains $nV / 2$ totals $(nH \times nV) / 4$ space sampling points to $nH / 2$ pieces, and a perpendicular direction horizontally at least is attained.

[0072] photoing only a luminance signal or G (green) signal in high resolution in this way here -- ** et al. -- ** -- it is because the vision of receiving human being is sharp compared with the thing to other signals.

[0073] In addition, the output picturized and read with each solid state image pickup devices 56, 57, and 58 of such the image pick-up section is supplied to signal-processing section 50'. In this case, signal-processing section 50' is based on the space pixel of the circumference which had the space pixel which was not picturized. Suitably, it interpolates and is nH horizontally. It is nV to an individual and a perpendicular direction. Three-primary-colors signals G, B, and R () including the pixel information on the total $(nH \times nV)$ individual of a book Or a luminance signal Y, two color-difference signals PB, and PR are generated, and it is made to output to output terminal 1' as a status signal, as shown in drawing 3.

[0074] Moreover, as mentioned above, in signal-processing section 50', the information signal of the analog suitable for record of a record medium 60 thru/or a digital format is generated, and it is suitably recorded on this record medium 60 with identification information and additional information.

[0075] In addition, the status signal which uses media, such as a magnetic tape, for a record medium 60, and is outputted through an output terminal 1 from the signal-processing section 50 (or 50') For example, record regenerative apparatus, such as VTR (VTR of a UNIHI method and VTR of a W-VHS method) corresponding to the usual Hi-Vision method, may be supplied, after changing into the record signal suitable for record of this record regenerative apparatus, it may record on this magnetic tape, and you may constitute so that it may be reproduced.

[0076] Now, semiconductor memory with comparatively small storage capacity, such as a flash memory, can also be used for the record medium 60 which records the image which the image pick-up equipment concerning this operation gestalt picturized. Moreover, image pick-up equipment can be used as a still picture photography subject's still camera in this case. Or if bulk memories, such as a magnetic tape and an optical disk, are used for this record medium 60, image pick-up equipment can be used as an animation photography subject's video camera. In addition, when using as a still camera, the signal-processing section 50 memorizes only the image for one frame to a storage 60, when there are directions of photography from a photography person.

[0077] Below, when the memory card of semiconductor memory types with comparatively small storage capacity, such as a flash memory, is used for a record medium 60, a record regenerative apparatus with the function which records separately the image memorized to the record medium 60 on other record media is explained.

[0078] The configuration of this record regenerative apparatus 200 is shown in drawing 8.

[0079] If the memory card 60 with which image pick-up equipment was equipped and which memorized the image is inserted in a card slot 210, with this record regenerative apparatus 200, a memory card 60 will be electrically combined with the card read station 230, so that it may illustrate. The card read station 230 reads information recorded on the memory card 60. The information read by the card read station 230 is supplied to the disk write-in read station 240.

[0080] On the other hand, in this record regenerative apparatus 200, the optical disk 70 inserted in the disk insertion opening 220 of the disk recorder 200 is optically combined with the disk write-in read station 240. And the reading information from the card read station 230 is serially written in an optical

disk 70 by this disk write-in read station 240.

[0081] In addition, as an optical disk 70, CD (compact disk), MD (mini disc), DVD (digital video disc), etc. are used.

[0082] Such a configuration is a configuration which makes it possible to present utilization equivalent to the conventional optical film magazine with a record medium (memory card) 60, and to present utilization equivalent to the conventional photograph album with a record medium (optical disk) 70.

[0083] Now, the disk write-in read station 240 can read serially the information written in the optical disk 70, and in this disk write-in read station 240, the reading information from that optical disk 70 or the reading information from the card read station 230 is changed into the status signal for carrying out image display with a television set, a monitor, etc., and is outputted to an output terminal 2. As this status signal, the signal of the same format as what was shown in previous drawing 3 can be used, for example.

[0084] By the way, as mentioned above, additional information, such as a date of a photography day, number of sheets of a photography image, the record address, and inclusion voice, is recordable on a memory card 60 with a stereo or high definition image information, and its identification information at the time of photography. In this record regenerative apparatus 200 then, the disk write-in read station 240 Based on the address information on the memory which shows the location where photography number of sheets and an image were recorded Only the effective part and the required part on which a photograph is taken actually and the image is recorded are read in a memory card 60, and it is made to align serially and you may make it record densely so that a useless non-recorded gap may not be produced to the predetermined address of an optical disk 70. Or arranging in the old order of for example, a photography day, and arranging serially to the optical disk 70 as an album based on the additional information which shows the date of a photography day, it records and you may make it go.

[0085] In addition, it is desirable to also record reading [in a memory card 60] identification information and additional information on this optical disk 70 together with image information if needed. Moreover, the content of the memory card is eliminated suitably if needed, and it can make it possible to use repeating the same memory card to the next photography.

[0086] If it is made to make such a series of actuation perform according to the program prepared beforehand using controlling elements, such as a microcomputer with which the disk write-in read station 240 was equipped, moreover, a user For example, these the processing control of a series of can be made to perform in auto mode automatically altogether in the record regenerative apparatus 200 based on a command signal, additional information, etc. from which the rest is obtained by the carbon button depression only by pushing the carbon button of album filing.

[0087] In this record regenerative apparatus 200, moreover, a user Since the activity of edit etc. can be performed carrying out the monitor of the status signal from an output terminal 2 with a television set etc., For example, carrying out the monitor of the one every piece of the image photoed in manual mode in hand control Record filing can be carried out serially and it can also go by order of arbitration to an optical disk 70, and edit record can also be carried out if needed, newly adding additional information, such as an alphabetic character title. Or other image information, such as CG (computer graphic) image, etc. is supplied to the disk write-in read station 240 from the input terminal 3 of this disk recorder 200, and you may make it make it insert in a photography image.

[0088] Furthermore, you may make it constitute the record regenerative apparatus 200 in an optical disk 70, so that every part required for other record media, for example, the medium which is not recorded [same] as an optical disk 70, or its **** can carry out the record copy of the information which carried out filing record.

[0089] Namely, for example, it sets to the disk write-in read station 240 based on the command signal acquired by the depression of a user's copy processing carbon button. It memorizes temporarily to the buffer memory which prepared the information read in the optical disk 70 of a copied material in the interior of the disk write-in read station 240. If it constitutes so that the information which inserts the new optical disk of a copy place after that, and was read in this buffer memory may be again recorded on this copy place optical disk Anyone can perform now simultaneously DPE processing equivalent to

the conventional film development and the conventional print of an optical camera easily. It is desirable to carry out for even button grabbing to be able to come out and for a user also able to perform this copy processing easily. Moreover, since a memory card is repeatedly applicable to photography any number of times, it can reduce a running cost substantially.

[0090] In addition, in the above copy record, recording [beforehand]-on memory card 60 identification information and additional information are also recorded on the new optical disk of this copy place together with a stereo or high definition image information if needed. Therefore, if this copied new optical disk is played by the disk write-in read station 240, a status signal as all information required for that display acquired, and identified a stereo or a high definition image automatically, for example, shown in drawing 3 by the same processing as the signal-processing section of said image pick-up equipment can be made to generate. Moreover, in the disk write-in read station 240, it is made to display on a screen or it also becomes [*** / making it display on a screen] possible to carry out a voice output from a loudspeaker by making into text speech information which added additional information, such as an image pick-up day which accompanies this image information, to this status signal, and was recorded at the time of photography.

[0091]

[Effect of the Invention] As mentioned above, the image pick-up equipment which can picturize the image, a left eye channel (L) and a right eye channel (R), of two channels by one set can be offered. Furthermore, while being able to picturize the image, a left eye channel (L) and a right eye channel (R), of two channels by one set, the image pick-up equipment which can picturize the image of one channel based on 1 or two or more methods can be offered. Moreover, the record regenerative apparatus suitable for management of the image photoed with these image pick-up equipments, or record and playback can be offered.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the configuration of image pick-up equipment.

[Drawing 2] It is drawing showing the situation of an image pick-up of the image pick-up section in solid mode and the highly minute mode.

[Drawing 3] It is drawing showing the status signal in solid mode and the highly minute mode.

[Drawing 4] It is drawing showing the relation between a status signal and a display in solid mode and the highly minute mode.

[Drawing 5] solid mode -- it is drawing showing the situation of an image pick-up of the image pick-up section to kick.

[Drawing 6] solid mode -- it is drawing showing the situation of an image pick-up of the image pick-up section to kick.

[Drawing 7] It is drawing showing the configuration of image pick-up equipment.

[Drawing 8] It is drawing showing the configuration of record re-equipment.

[Description of Notations]

10 Lens for Stereoscopic Cameras

20 Lens for Highly Minute Cameras

30 Mounting Section

11, 13, 21 Lens

12, 14, 53, 54, 55 Prism

40 Shutter

100 Image Pick-up Section Body

50 50' Signal-processing section

51 59 Color filter

52, 56, 57, 58 Solid state image pickup device

60 70 Record medium

200 Record Regenerative Apparatus

210,220 Insertion opening

230 Card Read Station

240 Disk Write-in Read Station

[Translation done.]

* NOTICES *

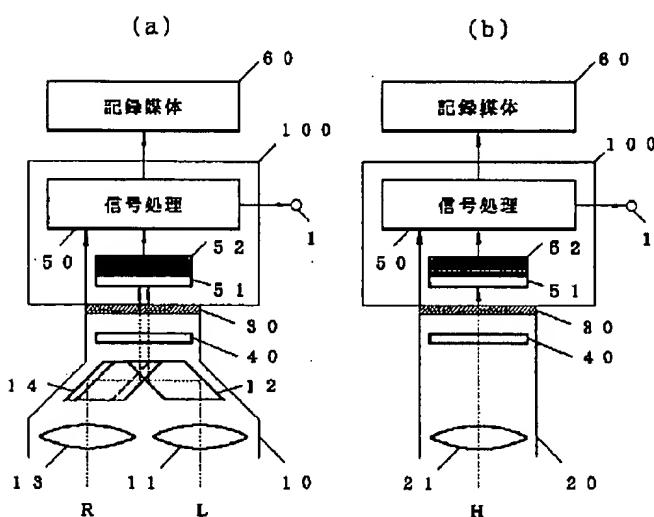
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DRAWINGS

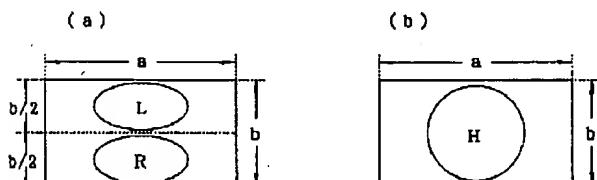
[Drawing 1]

図 1



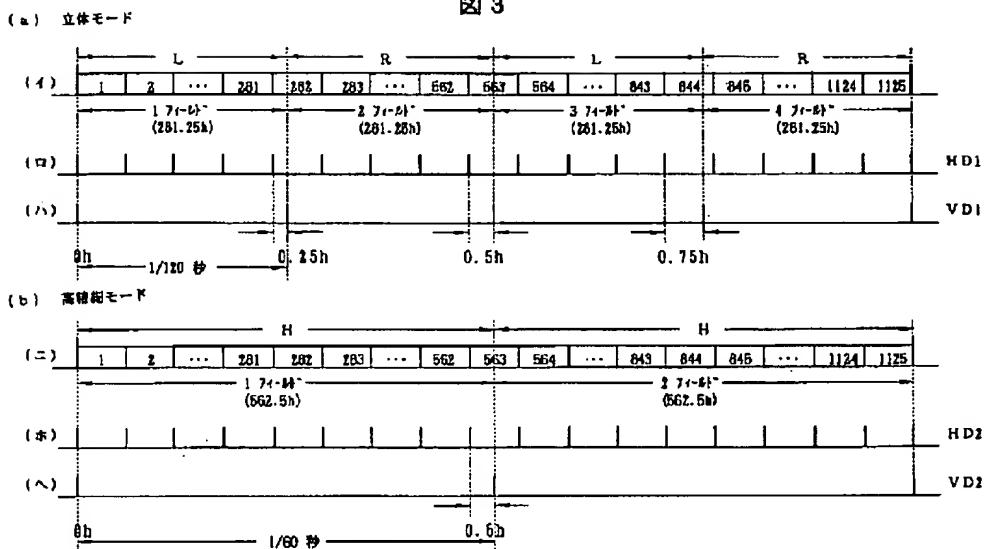
[Drawing 2]

図 2



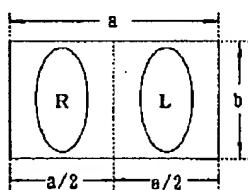
[Drawing 3]

図 3



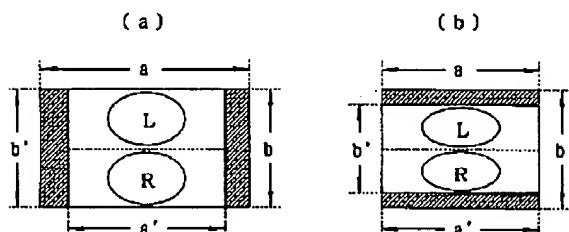
[Drawing 5]

図 5



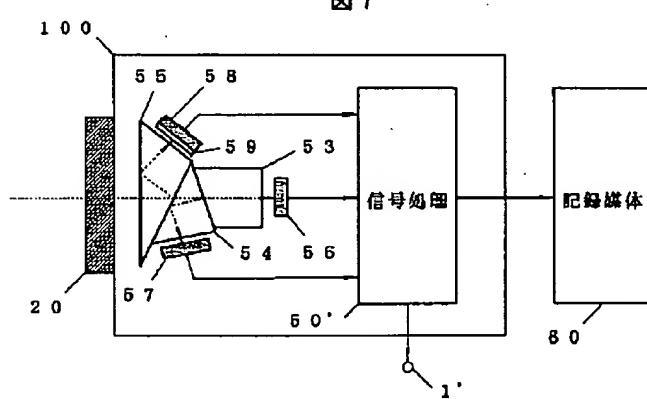
[Drawing 6]

図 6



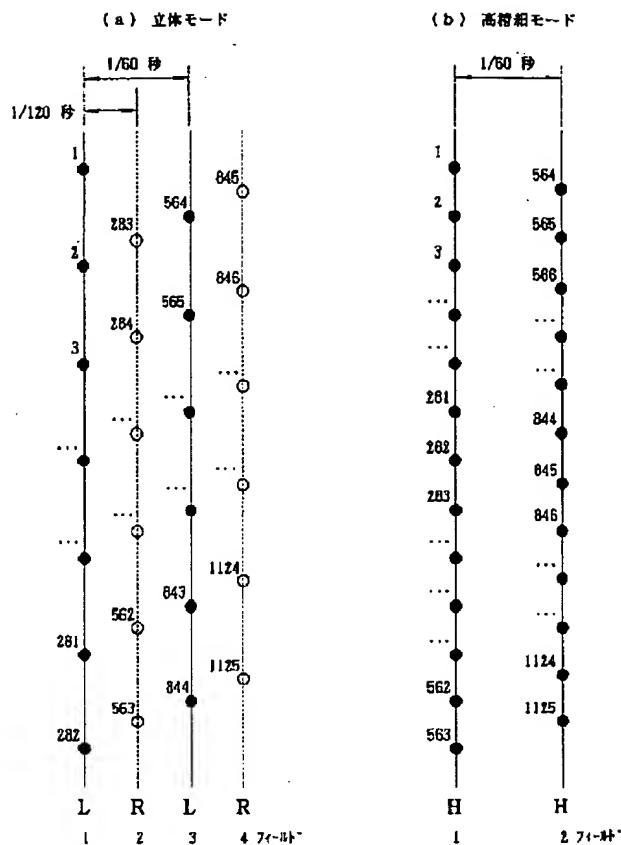
[Drawing 7]

図 7



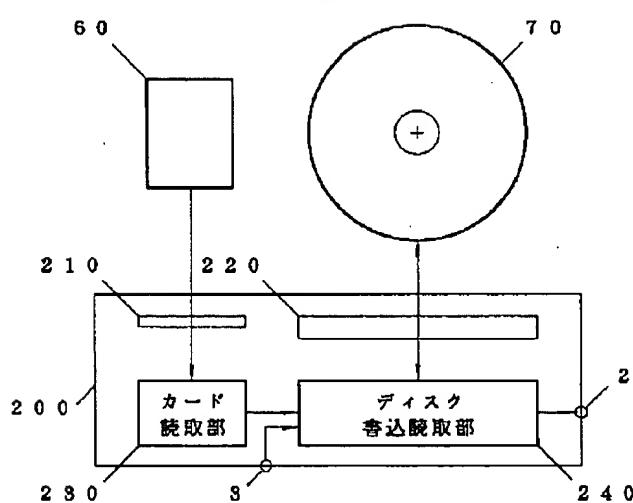
[Drawing 4]

図 4



[Drawing 8]

図 8



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CLAIMS

[Claim(s)]

[Claim 1] The image pick-up section which generates the picture signal showing the image which was equipped with the light-receiving side and carried out image formation on the light-receiving side concerned, the record signal for recording the image which performs predetermined processing to the picture signal which the image pick-up section concerned generated, and the picture signal concerned expresses with it -- or The image pick-up section body section equipped with the signal-processing section which generates the status signal for displaying the image which the picture signal concerned expresses, The optical system for right channel photography which carries out image formation of the optical image of an object to the field for right channel image photography which is a field of the abbreviation one half of said light-receiving side, To the field for left channel image photography which is a field of the abbreviation one half of said light-receiving side, and is a field which does not include said field for right channel image photography The lens section for solid image photography equipped with the optical system for left channel photography which carries out image formation of the optical image of the object incorporated on the left of the optical system for right channel photography, Image pick-up equipment characterized by having said lens section for solid image photography and the lens section for single channel image photography used selectively which equipped the **** field of said light-receiving side with the optical system which carries out image formation of the optical image of an object.

[Claim 2] The image pick-up section which generates the picture signal showing the image which was equipped with the light-receiving side and carried out image formation on the light-receiving side concerned, the record signal for recording the image which performs predetermined processing to the picture signal which the image pick-up section concerned generated, and the picture signal concerned expresses with it -- or The image pick-up section body section equipped with the signal-processing section which generates the status signal for displaying the image which the picture signal concerned expresses, The optical system for right channel photography which carries out image formation of the optical image of an object to the field for right channel image photography which is a field of the abbreviation one half of said light-receiving side, To the field for left channel image photography which is a field of the abbreviation one half of said light-receiving side, and is a field which does not include said field for right channel image photography Image pick-up equipment characterized by having the lens section for solid image photography equipped with the optical system for left channel photography which carries out image formation of the optical image of the object incorporated on the left of the optical system for right channel photography.

[Claim 3] It is image pick-up equipment characterized by the ability to be able to equip to be image pick-up equipment according to claim 2 , and possible [desorption] for the lens section for single channel image photography equipped with the optical system which said image pick-up section body section is equipped with said lens section for solid image photography possible [desorption] , replaces it with said lens section for solid image photography at said image pick-up section body section , and carries out image formation of the optical image of an object to the **** field of said light-receiving

side.

[Claim 4] It is image pick-up equipment characterized by what is recorded on said storage equipped with the record signal for recording the image which it is image pick-up equipment according to claim 1, 2, or 3, said image pick-up section body section is equipped with the storage for recording said record signal, said signal-processing section performs predetermined processing to the picture signal which said image pick-up section concerned generated, and the picture signal concerned expresses.

[Claim 5] It is image pick-up equipment according to claim 1 or 3. In said image pick-up section body section It is equipped with the storage for recording said record signal. Said signal-processing section While recording on said storage equipped with the record signal for recording the image which performs predetermined processing to the picture signal which said image pick-up section concerned generated, and the picture signal concerned expresses with it Image pick-up equipment with which the record signal concerned is characterized by recording the recognition signal showing whether it is a record signal showing the image which carried out image formation on said storage with which it was equipped by any of said lens for solid image photography, and the lens for single channel image photography.

[Claim 6] It is image pick-up equipment which is image pick-up equipment according to claim 5, and is characterized by said storage being a portable mold storage with which said image pick-up section body is equipped possible [desorption].

[Claim 7] It is image pick-up equipment according to claim 1 or 3. Said image pick-up section Generate the picture signal showing the image of the object formed only from the image or the 1st color of an object formed only from the brightness of horizontal resolution H and vertical definition V in complement. Horizontal to mutual, and two individual image sensors with which the sampling pitch shifted perpendicularly 1/2 and which have been arranged so that the sampling point on the image of an object may be sampled, Image pick-up equipment characterized by including one individual image sensor which generates the picture signal showing the image of the object formed only from the 2nd color, and the image of the object formed only from the 3rd color.

[Claim 8] It is image pick-up equipment according to claim 1 or 3. Said signal-processing section The status signal or record signal with which the image by which image formation was carried out to said field for left channel image photography is expressed when the picture signal which the image pick-up section generated is a thing showing the image in which said lens section for solid image photography carried out image formation on the light-receiving side, Image pick-up equipment characterized by generating by turns the status signal or record signal showing the image by which image formation was carried out to said field for right channel image photography.

[Claim 9] It is image pick-up equipment characterized by being image pick-up equipment according to claim 6, and said signal-processing section recording the management information for managing the image which the record signal concerned expresses with said record signal and recognition signal on said storage with which it was equipped.

[Claim 10] The playback section which reproduces the record signal which equipped with the portable mold storage according to claim 6, and was recorded on the portable mold storage concerned, and a recognition signal, A transfer means to transmit said record [which controls the record playback section which performs record and playback of the 2nd of a storage, and said playback section and said record playback section] signal by which it was recorded on said portable mold storage, and a recognition signal to said 2nd storage, Regeneration equipment characterized by performing predetermined processing which becomes settled according to the recognition signal reproduced from the 2nd storage by said record playback section to the record signal reproduced from the 2nd storage, and having a means to output the signal for displaying the image which the record signal concerned expresses.

[Claim 11] It is the record regenerative apparatus characterized by being regeneration equipment according to claim 10, and for said transfer means answering predetermined directions and transmitting two or more record signals showing two or more images memorized by said portable mold storage, and two or more recognition signals recorded with the record signal concerned to said 2nd storage one by one.

[Claim 12] The playback section which reproduces the record signal and recognition signal which

equipped with the portable mold storage according to claim 9, and were recorded on the portable mold storage concerned, and management information, A transfer means to transmit said record signal and recognition signal which controlled the record playback section which performs record and playback of the 2nd of a storage, and said playback section and said record playback section, and were recorded on said portable mold storage, and management information to said 2nd storage, Predetermined processing which becomes settled according to the recognition signal reproduced from the 2nd storage by said record playback section is performed to the record signal reproduced from the 2nd storage. Regeneration equipment characterized by having a means to output the signal for displaying the information which the image which the record signal concerned expresses, and the management information reproduced from the 2nd storage express.

[Claim 13] The playback section which reproduces the record signal and recognition signal which equipped with the portable mold storage according to claim 9, and were recorded on the portable mold storage concerned, and management information, The record playback section which performs record and playback of the 2nd of a storage, and said playback section and said record playback section are controlled. A transfer means to transmit said record signal and recognition signal which were recorded on said portable mold storage, and management information to the location which becomes settled according to the management information concerned of said 2nd storage, Regeneration equipment characterized by performing predetermined processing which becomes settled according to the recognition signal reproduced from the 2nd storage by said record playback section to the record signal reproduced from the 2nd storage, and having a means to output the signal for displaying the image which the record signal concerned expresses.

[Translation done.]